

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> : B05B 15/04, B05D 1/32	A1	(11) International Publication Number: WO 92/18253 (43) International Publication Date: 29 October 1992 (29.10.92)
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(21) International Application Number: PCT/US92/02031

(22) International Filing Date: 13 March 1992 (13.03.92)

(30) Priority data:  
9108401.2 19 April 1991 (19.04.91) GB

(71) Applicant (for all designated States except US): MINNESOTA MINING AND MANUFACTURING COMPANY [US/US]; Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): MITCHELL, Philip, A. [GB/GB]; 18 Kennel Lane, Witherley, Atherstone, Warwickshire CV9 3LJ (GB).

(74) Agents: HUEBSCH, William, L. et al.; Minnesota Mining and Manufacturing Company, Office of Intellectual Property Counsel, P.O. Box 33427, Saint Paul, MN 55133-3427 (US).

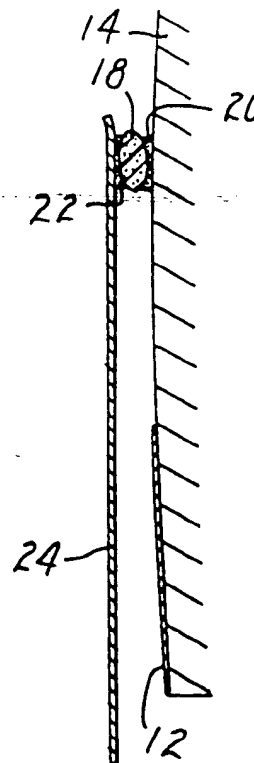
(81) Designated States: AT (European patent), AU, BE (European patent), BR, CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), MC (European patent), NL (European patent), SE (European patent), US.

Published  
With international search report.

(54) Title: MASKING METHODS USING FLEXIBLE STRIP

## (57) Abstract

A method of masking an area of a surface using a length of flexible foam strip (18) having a layer (20, 22) of adhesive applied on opposite sides of the strip. The strip (18) is attached to the surface (14) by one (20) of the layers of adhesive and a sheet (24) of material is attached to the opposite side of the strip (18) by the other (22) of the layers of adhesive. The strip (18) and sheet (24) then isolate the area of the surface from contiguous areas of the surface.



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MASKING METHODS USING FLEXIBLE STRIPTechnical Field

The present invention relates to methods for masking  
5 an exposed area of a surface from an adjacent area to  
facilitate treatment of the exposed area by for example  
paint spraying. The invention has particular, but not  
exclusive application in the motor industry where  
selective repairs must be effected on painted surfaces.  
10 The invention also relates to a gasketting material for  
use in such methods.

Background Art

Various masking techniques are known for isolating  
15 areas from adjacent areas on a surface. Such isolation  
is needed in a number of situations where treatment of  
one form or another is to be applied exclusively to a  
specific area or region. Masking techniques are  
particularly useful when the treatment involves the  
20 application of a fluid medium. Examples are chemical  
treatments, painting and decorating. Typically, the  
treatment areas are isolated from their surroundings by  
a masking tape which defines the boundary thereof.

25 Disclosure of Invention

The present invention is directed at a masking  
technique in which the boundary of the treatment area is  
defined by a length of foam strip adhesively secured to  
the surface. The strip has a layer of adhesive applied  
30 on opposite sides thereof, whereby one layer secures the  
strip to the surface, and the other is available for  
attachment to a sheet of material. The sheet of material  
is attached in such a way that it extends laterally of  
the strip, protecting the surface adjacent that flank and  
35 leaving the surface adjacent the other flank exposed with  
a sheet of material attached in this way, the strip and  
sheet thereby isolate an area of the surface from a

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contiguous area. The sheet of material can be attached to the foam strip with a substantial overlap, and the sheet of material trimmed thereafter before the surface area is treated.

5       The invention is also embodied in a length of foam strip having a layer of adhesive applied on opposite sides thereof. In preferred embodiments, the adhesive forming one of the layers thereof is more aggressive than the adhesive forming the other layer, and the less  
10 aggressive adhesive layer is used to secure the strip to the surface. Thus, in use the more aggressive adhesive is preferentially adhered to the sheet of material, which facilitates the subsequent removal of the strip or mask from the surface. The strip may come in the form of an  
15 endless length, and in some embodiments can include a sheet of material secured to the strip by one of the adhesive layers.

In preferred embodiments of the invention, the crosssection of the foam strip has a periphery forming a  
20 continuous smooth curve. Normally, it will be circular or elliptical. This facilitates the formation of a soft edge between the treated and untreated areas.

#### Brief Description of the Drawing

25       The invention will now be further described by way of example, and with reference to the accompanying schematic drawings wherein:

Figure 1 illustrates a car door with lengths of gasketting material secured thereto;

30       Figure 2 is a section taken on line II-II of Figure 1;

Figure 3 is a perspective view showing gasketting material according to the invention drawn from a roll thereof.

35       Figure 4 is a perspective view of a part of a car hood; and

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Figure 5 is a cross-section taken on line V-V of Figure 4.

#### Detailed Description

5        Figure 1 is a side view of a car door with a surface area "X" thereof having been repaired, but not yet re-painted. The car door is shown separated from the car body, but is otherwise intact with windows 2 and 4, and frame 6 fitted thereto, and door handle 8 and mirror  
10 mount 10 still in place. Additionally, at the bottom edge of the door is an extra protective layer 12. Secured to the door panel 14 are two lengths of strip 16, 18 attached by adhesive to undamaged areas of the panel 14. The strips 16 and 18 define two boundaries of the  
15 repaired area "X", and thereby separate the repaired area "X" from the undamaged areas of the panel 14 on or in which are mounted auxiliary features (8, 10, and 12).

In Figure 1, the strips 16 and 18 are visible and as shown, merely form a divide between adjacent areas of the  
20 surface of panel 14. In use, sheets of material 24 would be applied to each strip, the respective sheets extending over the panel and auxiliary components to enable the area "X" to be treated; ie, in this example spray painted, to complete a repair. The disposition of such  
25 a sheet of material is shown in Figure 2. As can also be seen in Figure 3, the foam strip bears two separately identifiable layers 20 and 22 of adhesive. Adhesive layer 20 secures the strip 10 to the panel 14. A sheet 24 of flexible material is adhered along a marginal edge  
30 portion to the adhesive layer 22. The free edge of the sheet 24, on the right flank of the strip 18 as shown in Figure 2, can be trimmed so that the foam strip 18 is substantially visible from that side. On the left flank of the strip 18 as shown in Figure 2, the sheet 24  
35 extends either freely or to a remote securement point which may be on the layer 12, but in any event in such a manner effectively to protect the panel 14 below the

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strip 18 in Figure 1 from any overspray directed at the area "X". The area above the strip 16 in Figure 1 would be similarly protected by the application of a sheet of material (not shown) to the strip 16. Suitable materials  
5 for the sheet 24 include paper, coated paper and plastics materials.

Figure 3 shows a foam strip embodying the invention drawn from a roll 26 thereof. The material of the strip will normally be a plastics foam, and is preferably one  
10 made in accordance with our published European Patent Specification No. 0384626. Polyether foam is particularly suitable. Various adhesives can be used for the layers 20 and 22, and emulsion adhesives can be satisfactory. In any event, pressure sensitive adhesives  
15 are preferred to ensure that the strip can be properly located on the surface. A double sided release liner 28 attached to the adhesive layer 22 is shown peeled away to prepare the exposed length for use. The cross-section of the strip is typically circular or elliptical, with  
20 minimum diameters in the range of 15 to 20 mms being preferred.

The adhesive of one layer of the foam strip is normally more aggressive than that of the other. In the example illustrated, the layer 22 is the more aggressive  
25 adhesive, and the less aggressive layer 20 is the one that is applied to the panel surface. In order to enable the strip to be used in this manner, the adhesive layers can be distinguished from one another, normally by a visible difference such as colour. Alternatively, the  
30 adhesive layers may be applied to the strip in different patterns, and one or each layer may be discontinuous. Normally though, continuous layers are preferred.

In the embodiment of the invention described above, the area "X" of the panel 14 was isolated by the  
35 sequential application of the strips 16 and 18, and the sheets 24. This is the normal arrangement, and provides the greatest flexibility, but it will be appreciated that

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other techniques can be used. For example, it may be desirable to protect an isolated area of a panel from treatment, and such an arrangement is shown in Figures 4 and 5.

5 Figure 4 shows the front section of a car hood 30, most of which is to be re-painted. An emblem 32 is mounted on the hood 30, and as the paintwork around the emblem 32 does not require re-painting, this area of the hood is to be isolated from the remainder. To achieve  
10 this, a strip 34 of gasketting material according to the invention is applied in a continuous length around the emblem to the surface of the hood 30. This is shown more clearly in Figure 5. As can be seen, the strip 34 encloses the emblem 32, and a sheet 36 of material  
15 adhered to the strip 34 isolates the emblem and its immediate surroundings. It will be appreciated that the arrangement shown in Figure 5 is substantially the same as that shown in Figure 2, but with a single length of strip 34 firmly holding the sheet of material 36.  
20 In some further embodiments, a masking unit may be provided with the sheet already adhesively secured to the foam strip. The sheet and strip can be wound on a roll, or provided as a ready made panel, as shown in Figure 5. Here, the sheet 36 is already adhered to the endless  
25 strip 34. It is then possible to isolate an area of the surface in a single exercise.

The technique described herein has particular benefit in paint repairs, as the foam strip greatly facilitates the achievement of a soft edge between  
30 painted and unpainted areas. The reason for this is that the circular or elliptical cross-section of the preferred foam strip, as shown for example in Figures 2, 3 and 5, avoids the definition of a sharp edge or boundary. The new paint is thus applied in a reducing thickness under  
35 the overhanging section of the strip to merge tidily with the contiguous unpainted area. The overhanging section can also be extended if required by the sheet 24 or 36.

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While paint repairs constitute a preferred application of the invention, the technique is also useful for other surface treatments such as coating, plating and phosphorizing.



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CLAIMS

1. A method of masking an area of a surface using a gasketting material in the form of a length of flexible foam strip having a layer of adhesive applied on opposite sides of the strip wherein the strip is attached to the surface by one of the layers of adhesive and a sheet of material is attached to the opposite side of the strip by the other of the layers of adhesive, the strip and sheet thereby isolating said area of the surface from a contiguous area of the surface.
2. A method according to Claim 1 including the step of trimming the sheet along one edge adjacent the strip.
3. A method according to Claim 1 wherein a marginal edge portion of the sheet of material is attached to said opposite side of the strip.
4. A method according to any preceding Claim wherein the adhesive forming one of said adhesive layers is less aggressive than the adhesive forming the other layer, and wherein the less aggressive layer attaches the strip to the surface.
5. A method according to any preceding claim wherein the strip is attached to the surface in the form of a closed curve, thereby enclosing said area.
6. A method according to any preceding Claim wherein the cross-section of the foam strip has a periphery forming a continuous smooth curve.
7. A gasketting material in the form of a length of flexible foam strip having a layer of adhesive applied on opposite sides thereof.

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8. A material according to Claim 7 wherein the adhesive forming one of said adhesive layers is more aggressive than the adhesive forming the other layer.

5 9. A material according to claim 7 or Claim 8 in the form of an endless length of said strip.

10. A material according to Claim 9 including a sheet of material adhesively secured to the strip by one  
10 of said layers of adhesive.

11. A material according to any of Claims 7 to 9 wherein the adhesive layers are visibly distinguishable from each other.

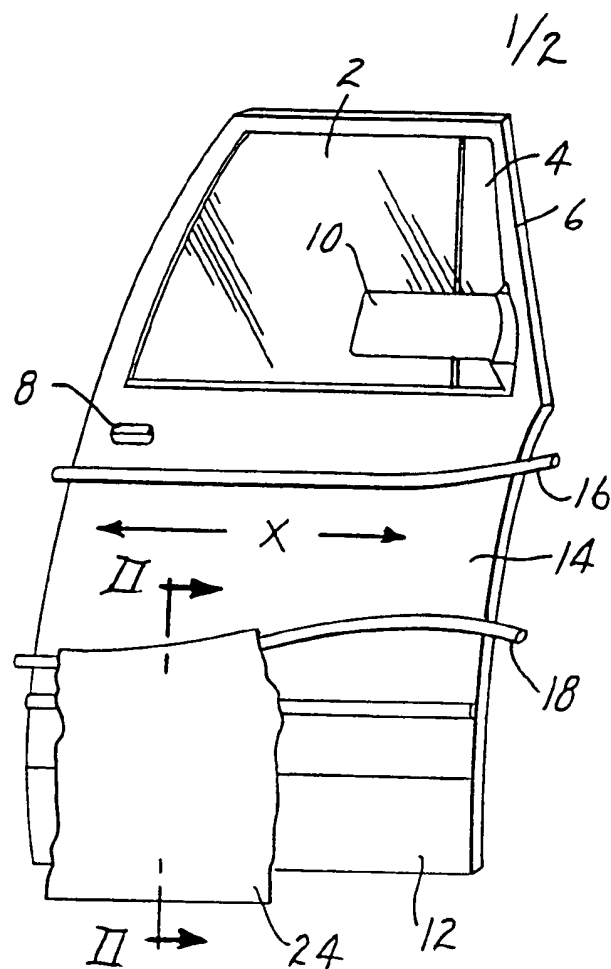
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12. A material according to Claim 10 wherein each layer of adhesive is a continuous coating.

13. A material according to any of Claims 7 to 12  
20 wherein the cross-section of the foam strip has a periphery forming a continuous smooth curve.

14. A material according to Claim 13 wherein said periphery is one of circular or elliptical.

25



*FIG.1*

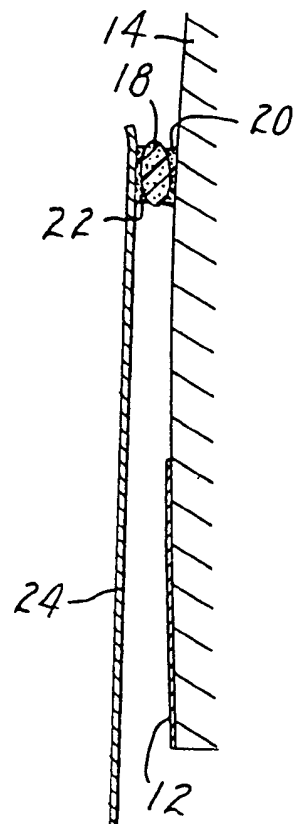


FIG. 2

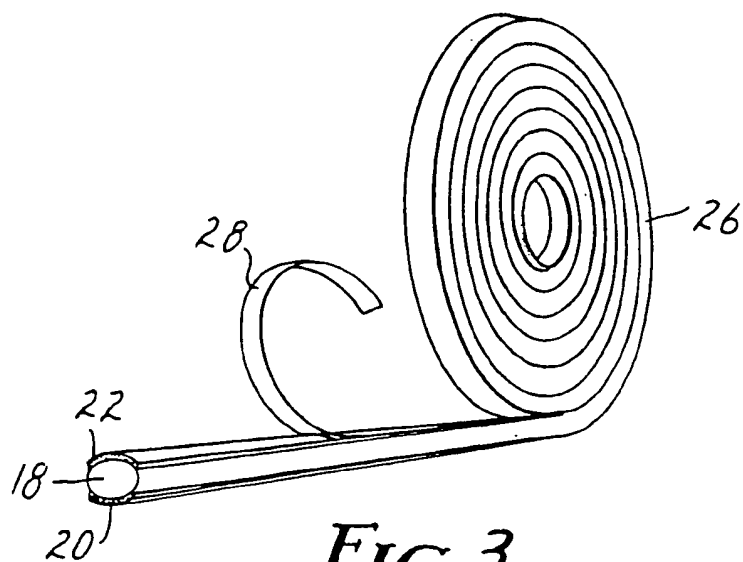
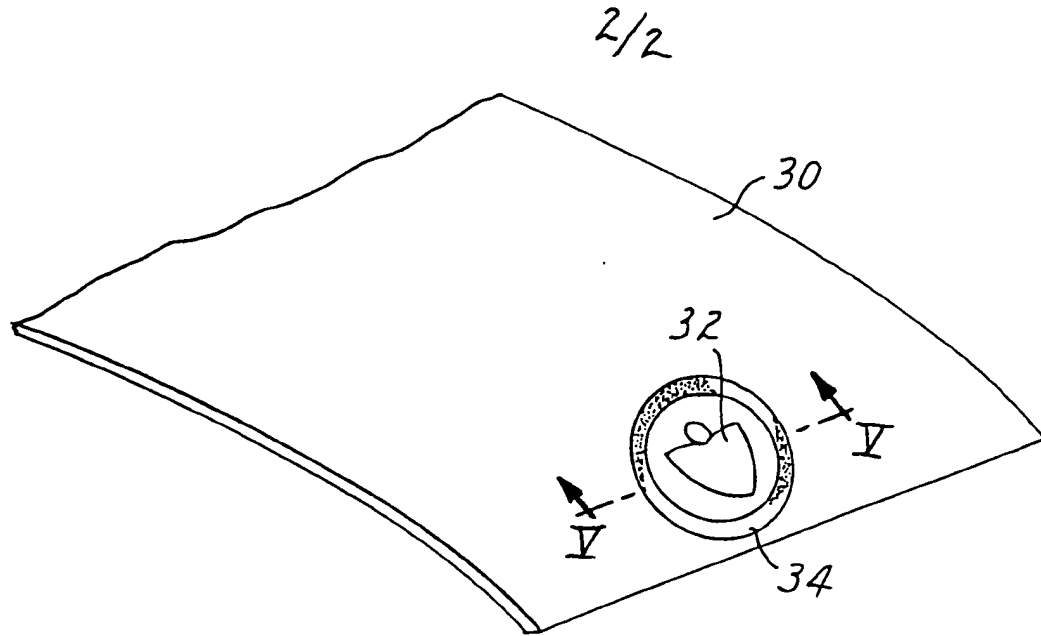
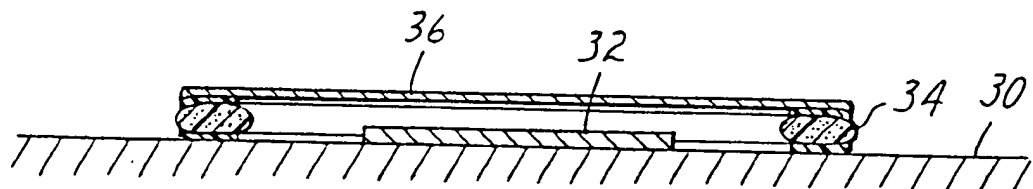


FIG. 3

*FIG. 4**FIG. 5*

**I. CLASSIFICATION OF SUBJECT MATTER** (If several classification symbols apply, indicate all)<sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC  
 Int.Cl. 5 B05B15/04; B05D1/32

**II. FIELDS SEARCHED**Minimum Documentation Searched<sup>7</sup>

Classification System	Classification Symbols
Int.Cl. 5	B05C

Documentation Searched other than Minimum Documentation  
 to the extent that such Documents are included in the Fields Searched<sup>8</sup>

**III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup>**

Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	PATENT ABSTRACTS OF JAPAN vol. 12, no. 365 (C-532)29 September 1988 & JP,A,63 116 777 ( NIPPON STEEL CORP. ) 31 October 1986	1,3,5,7, 9,10,12
Y	see abstract ---	4,8,11
Y	WO,A,8 807 415 (INTERMALL AB) 6 October 1988 see page 8, line 6 - line 18; figures 1-4 ---	4,8,11
A	EP,A,0 384 626 (MINNESOTA MINING AND MANUFACTURING COMPANY) 29 August 1990 cited in the application see column 6, line 3 - line 6 ---	6,13,14

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**IV. CERTIFICATION**

Date of the Actual Completion of the International Search

20 JULY 1992

Date of Mailing of this International Search Report

07.08.92

International Searching Authority

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**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
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US 9202031  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO-A-8807415	06-10-88	EP-A-	0357627	14-03-90
		JP-T-	2503290	11-10-90
		SE-B-	465626	07-10-91
		SE-A-	8801094	26-09-88
		US-A-	5049445	17-09-91
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EP-A-0384626	29-08-90	CA-A-	2009721	20-08-90
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